6-2018

Supply market analysis: The moderating effect of social networking on cost reduction

Adam Cockrell
DePaul University

SUPPLY MARKET ANALYSIS:

THE MODERATING EFFECT OF SOCIAL NETWORKING ON COST REDUCTION

By: Adam Cockrell, Doctoral Business Candidate
Dissertation Chair: Nezih Altay, PhD
Kellstadt Graduate School of Business, DePaul University

Abstract

As organizations look for more efficient ways to grow and optimize their supplier network to meet demands, the sourcing process must be streamlined through social networking. Kraljic's (1983) purchasing portfolio approach argues that different types of purchases need different sourcing strategies. This study extends beyond this strategy by introducing a novel approach of social networking as a mechanism to amplify cost reduction. Through the theoretical underpinning of Transaction Cost Theory, this study builds upon the use of social networking to establish the foundation for future research in this area. In this study, existing and former Purchasing Managers (Sourcing Managers, Procurement Managers, or Buyers), responded to an online survey about their experience with purchasing in the context of three areas: supply market analysis, social networking, and cost reduction. Results revealed that Purchasing Managers use social networking as a strategic sourcing approach to find competitive suppliers. The strategic sourcing approach is identified as supply market analysis, which is the sourcing or supplier research aspect of the 7-step strategic sourcing methodology.

Introduction

Strategic Sourcing is an essential practice to finding optimal value for the commodities and services used in an organization. A major strategic concept in sourcing decisions is core competence (Quinn & Hilmer, 1994). Purchasing Managers must be able to translate demand into sourcing decisions that align to the core competencies of an organization. Sourcing decisions are a core competency for a firm. Top management recognizes the strategic purchasing function as an important resource of the firm (Gargeya & Su, 2004). According to Porter (1985), purchasing strategy should be part of the overall corporate strategy. Purchasing Managers can achieve a cost reduction by using social networking via the supply market analysis aspect of the seven-step strategic sourcing methodology to find the most competitive suppliers.

The seven-step strategic sourcing methodology is a popular framework developed by the strategy consulting firm, AT Kearney in 2001. The seven steps include: profiling the category, selecting the sourcing strategy, generating the supplier portfolio, selecting the implementation path, negotiating and selecting suppliers, integrating suppliers, and monitoring (benchmarking) the supply market and supplier performance. Supply market analysis is the second facet of the first step (profiling the category) in the seven-step process. See Figure 1.

Figure #1

Clegg & Montgomery (2005) explains supply market analysis as a category profile, which seeks to understand the external supply market in which the supplier operates, and the market pressures the supplier faces. It answers questions such as: What is the current competitive situation? Are providers under cost pressures, competitive pressures, technology pressures? What other suppliers could supply the same content and functionality (or nearly so)? What are the trends in the

information industry? What insights can you get into the value chain, suppliers' cost structures, and pricing? Hargraves (2008), defines supply market analysis as developing a commodity profile, examining cost structures, researching suppliers, and identifying key market indicators. This study focuses on the supply market analysis aspect of strategic sourcing. Drawing on the validated supply market analysis measures of Knight and others (2014), I suggest that social networking can be used to find suppliers according to a supply market profile.

As organizations continue to search for ways to improve upon their costs, there is an opportunity for firms to streamline the sourcing approach through social networking. Whether the medium is offline (e.g. industry conferences, workshops, etc.) or online (LinkedIn, Blogs, etc.), the predominant component among these mediums is the social network.

Supply market analysis plays a vital role in helping firms find the right suppliers to help manage costs and remain competitive in the marketplace. Supply market analysis is the fundamental knowledge that is needed to drive better procurement decisions and is an important skill for supply chain professionals managing spend categories (Hargraves, 2010). Finding the right suppliers that aligns to a firm's strategic goals and capabilities has strong implications on strategic sourcing.

The value of social networking as a supplier sourcing option can be explained through the theoretical underpinning of social network theory and Transaction Cost Theory. In a case study conducted by Liebeskind and others (1994), two successful biotechnology firms are examined to determine how they both sourced scientific knowledge. Their findings indicated that the use of boundary-spanning social networks by the two firms increased their knowledge and adaptability, which might not otherwise be possible in a self-contained hierarchical organization. Powell (1990) argued that social networks provide reliable information, which facilitates efficient organizational learning. Zucker (1991) argued that the bureaucracies of a firm often lack the expert information

and must seek it externally. Grant (1996) argued that sourcing through social networks can enable a firm to integrate knowledge more effectively than information acquired through licensing, which doesn't allow for learning-by-doing or open-ended learning. In sum, these arguments suggest that social networking provide access to reliable information that might not otherwise be available through a pure market exchange of information. This phenomenon can be linked with social network theory. Coleman (1988) argues that by understanding the mappings connecting individuals to a set of others, we stand to learn much about how individuals use their connections to achieve desired outcomes. In the same vein, Purchasing Managers can use social networking as a practical sourcing strategy to find reliable suppliers. The social network ties facilitate inter-member social interactions and provide channels for social exchange (Inkpen, et al 2005). This exchange reduces transaction costs between the purchaser and the supplier. This is the correlation to transaction cost theory.

This thesis offers insights that delve into the role social networking plays in the sourcing process, specifically in supply market analysis. Based on a literature review and an online survey, the relationship between supply market analysis and cost reduction is examined through the moderating effect of social networking, along with a detailed explanation of the conceptual framework. This study contributes to the Purchasing discipline by helping Purchasing Managers consider combined methods for sourcing suppliers. Purchasing Managers can reference this research to improve their sourcing strategy to find the appropriate number of suppliers, for the right category, in the right geographical location, at a competitive price. Although supply market analysis and social networking are not new strategies, the science of how to apply these strategies, is a new way of looking at the sourcing process. This research is a roadmap of how Purchasing

Managers can leverage the supply market more efficiently through social networking as a means to support the cost demands of their organizations.

Literature Review

Supply Market Analysis

Supply Market Analysis allows a firm to assess the supply market to identify the most competitive suppliers. The primary objective of supply market analysis is to develop the intelligence necessary to drive better procurement decisions (Hargraves, 2008). Supply market analysis emanates from Kraljic's (1983) purchasing portfolio approach. The portfolio approach encompasses four phases: product classification, supply market analysis (profile), determination of strategic supply position, and development of strategy. The Kraljic matrix categorizes purchases against external and internal dimensions. The external dimensions deal with suppliers and the supply market. The internal dimensions focus on the importance and profit impact of a given product (Dubois and Pedersen, 2002). The dimensions are compared against factors and variables, and differentiated through four types of purchasing situations. See Figure 2.

Leverage items	Strategic items
Materials management: Exploit purchasing power	Supply Management: Establish partnerships
Noncritical items	**Bottleneck items**
Purchasing management: Increase operational efficiency	Sourcing Management: Assure supply and seek alternative suppliers

Figure #2 *(Kraljic, 1983)*

AT Kearney's seven-step process expands upon Kraljic's approach in the Supply Market Analysis phase by emphasizing the importance of understanding the supply market before making sourcing decisions. Clegg and Montgomery (2005) suggest that it is helpful to use a tool like Porter's five forces analysis to survey the market in this phase. See Figure 3.

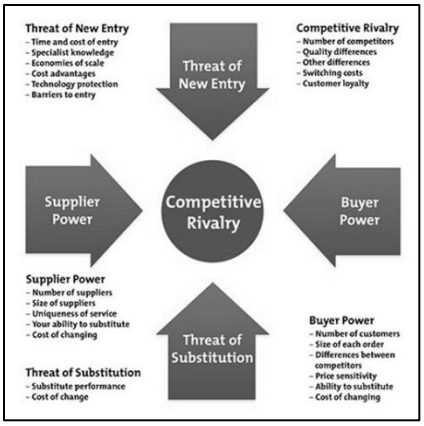


Figure #3 *(Porter, 1979)*

Tools such as Porter's 5 forces analysis helps identify the key elements of the supply market and organize the intelligence acquired. Once organized, the supply market data collection can be summarized into the following categories: commodity profile, cost structure, supply base, key market indicators (Hargraves, 2008). The commodity profile section of the supply market analysis provides clarity of what specific product or service is being examined and defines the scope of the supply market analysis. The cost structure presents the core information needed to understand supplier costs. This can be achieved through published financial statements or presentations given by the supplier to the investment community. The supply base portion helps a Purchasing Manager determine the structure and history of the supply base. This is fundamental to the supply market analysis because it gives information on such items as the availability of low cost suppliers, possible supply channels, geographic location of suppliers, and merger and acquisition activity. Market indicators provide key insights into the current state of the market that you intend to source from, and can help identify trends in the marketplace.

Social Networking

Sourcing information from external experts not only increases learning, but also increases the flexibility of a firm's boundaries because each external expert represents a "strategic sourcing option" that the firm can exercise only when necessary (Volberda, 1996). Yong et al (2008),

explain social networking through three measures: Cognition and affect-based trust, types of network ties, and Alter's embeddedness. Cognition and affect-based trust refers to trust "from the head," which is a judgement based on evidence of another's competence and reliability. Types of network ties connect participants and their network members. Alter's embeddedness refers to a focal individual as "ego" and to his/her network members as "alters"; positive or negative ties that exist between an alter and other network members. According Fernandez-Perez & Gutierrez-Gutierrez (2013), the nexus between the informational benefits of social networks and their utility in generating organizational learning and strategic flexibility, can be explained through three dimensions of social networks: network size, network range, and network strength. Network size represents the total group of links that a person has with another ones, total of information channels. Network range represents the diversity of contacts in a social network. It is the variety of groups (clients, suppliers, etc.). The strength of the ties is a multifaceted construct consisting of interaction frequency, and the emotional intensity or closeness of a bond (Granovetter, 1973). Collins and Clark (2003) further expounds on strength of ties as a linear combination of the standardized scores of three components of strength, which include: interaction frequency, relationship duration, and emotional intensity. Interaction frequency depicts the average times per month a person interacts with identified contacts. Relationship duration depicts the length of time a person has known a contact. Emotional intensity depicts the closeness of the relationship with a contact.

Social networks can be described as networks that involve direct (strong) and indirect (weak) relationship strengths. The strength of social networks can be influenced by several factors such as social relation, trust, and reciprocity involving networked members and organizations (Cheung, & Chan, 2010). A strongly-tied social network is related to the relationships that an individual has

with friends and family; there is usually frequent contact and emotional connectedness. A social network with weak ties is an accumulation of a collection of acquaintances that hardly know each other or have no relationship to each other. Social networks can provide Purchasing Managers with opportunities of establishing new suppliers.

Social Networking: Online and Offline

Online social networks are collections of individuals who share information regarding a common interest in an online setting over the internet (Kumar et al, 1999). Social Networking sites such as LinkedIn and Facebook allow their members to edit a profile page within the site, develop a list of other members on the site with whom they share a connection, view the profiles and posts of other members, and send messages to other members (Boyd and Ellison, 2008). There are also Web logs, or blogs which are websites on which dated journal entries are posted and displayed in reverse chronological order. Blogs can also help form online social networks through various means, such as subscription, co-membership, comment, and citation (Chau and Xu, 2007). Offline networks are defined as a hardware device which acts as a rendezvous point between various users located in reach of that device, who can potentially form a social network, exchange data, store their own data, use the local data stored, while potentially enjoying all the standard functionalities of an online social network (Kermarrec and Merrer, 2012).

Offline social networks are an extension of online networks. Participation in social networks is typically reciprocal of costs and benefits. When time is invested into a relationship, there is an expectation of mutual benefits. In offline communities, there are established rules and roles that migrate into the online community (Preece and Maloney-Krichmar, 2003). An example of this can be seen in an industry organization, whereas there are formal procedures, inclusive of membership and a hierarchical structure. The rules that are set up online are likely to reflect the governance

established in its offline structure. The main difference between offline and online networks is the presence of reciprocity. In the example, reciprocity is less likely to happen because the probability of meeting someone online is lower. The reverse is true in a physical community where the probability of meeting face-to-face is likely. When there is little expectation that participants will encounter each other face-to-face, there is more temptation for people to take resources (help, information, support) from the group and not give back (Walther, 1994).

Cost Reduction

Cost reduction is the real and permanent reduction in the cost of goods and services (Jain, 2014). Cost reduction is the process used by companies to decrease their costs and increase their profits (Singhal, 2015). Cost reduction helps organizations achieve profitability through continuous efforts to challenge established financial targets. It does not consider any condition of cost to be permanent, and therefore operates with curative purpose, despite the existence of a control management process. Cost reduction can be explained through cost performance. Hesping (2017) adapted the studies conducted by Krause et al (2001) and Terpend et al (2011) to use cost performance as a dimension to measure cost reduction. Krause et al (2001) lays the foundation for the competitive dimensions of purchasing (cost is one of the dimensions). This is expanded by Terpend et al (2011) through purchase type (strategic, captive-buyer, non-critical, and adversarial) and the effect on performance factors such as cost. Cost performance deals with the achievement of a task measured against cost. Supply market analysis can be the task used to improve cost performance and reduce costs. The knowledge gained through completion of a supply market analysis will provide the intelligence needed to identify optimal sourcing strategy options, and can provide cost structure insights to help determine if a product or service is being acquired

at the best possible price (Hargraves, 2008). The impact (strength) of the cost reduction is amplified by social networking.

Conceptual Model, Assumptions, & Hypothesis

Conceptual Model

One of the most fundamental principles of social network theory is that social structure influences the attitudes, behaviors, and outcomes of parties that are part of a social network, and this typically occurs when one party seeks to acquire resources to fulfill one's need, which is often dependent on social exchange (Cheung and Chen, 2010). This type of exchange can be greatly strengthened from a party's access to social capital (Lin and Erickson, 2008). The increased use of technology and social media mechanisms make social network theory a very relevant phenomenon for Purchasing Managers. Purchasing Managers can leverage social network theory to build an increased amount of social currency to generate adaptive relationships based on trust and reputation. In response to escalating competition, shorter product life cycles, and rapidly changing customer demands, more companies have become concerned and involved with developing long-term supplier capabilities (Gargeya & Su, 2004). This suggests that there is a critical need to invoke effective supplier selection and evaluation. As more firms increase their reliance on suppliers, supplier selection and evaluation must be strategic and flexible to accommodate the requirements of a firm.

Social Networks: Transaction Cost Theory

Transaction Cost Theory argues that there are costs to conduct transactions through the market; these transaction costs can be reduced through mechanisms other than markets (Coase, 1937; Williamson, 1975). Specifically, there are costs to "drafting, negotiating, and safeguarding any exchange or transaction" that are "friction" impeding smooth transactions (Williamson, 1985).

One may concur that social relations between individuals (or firms) may act to, for instance, reduce transactions costs (Granovetter, 1985). Traditionally, the relationship between the buyer and seller emphasized bargaining power; this is explained in Porter's five competitive forces model. In its pure form, this approach assumes an inherently adversarial interaction to exist between firms, and the recommended strategies follow from an overall objective of extracting concessions from the exchange partner (Heide & Stump, 1995). In contrast, social networking creates a way for the buyer and seller to develop a closer relationship to optimize transaction costs. The main premise of transaction cost theory is that modes of exchange should be selected that economize on these costs (Heide & Stump, 1995).

How does Social Networking Lower Transaction Costs?

Social Networking can reduce the need to use an intermediary to source suppliers. For example, a department store can minimize the need to use a sourcing company because social networking presents another option for the sourcing process. Social Networks generate access to supplier information to aid the Purchasing Manager with identifying cost-effective suppliers. Networks can provide access to information that can reduce transaction costs (Henning et al, 2012). It is the access to reliable and accessible information in the social network, which reduces the searching costs. Access to information and consequently the impact of networks on firm performance depends on the firm's position in the network, i.e. a firm's position in the network impacts its access to information which in turn affects transaction costs (Henningsen et al, 2013). Transaction costs can be divided into two main categories: technological transaction costs and institutional transaction costs (Green and Sheshinski, 1975). Institutional transaction costs can occur at three different stages of the transaction: i) contact phase, ii) contracting phase, and iii) control phase (den Butter and Mosch, 2003). In the Contact Phase, organizations are searching for information

on their suppliers. These searching costs occur because the search for information is not free, nor is information always complete, reliable, or easily accessible (Akerlof, 1970). Well-functioning networks can provide their members with information on business opportunities by providing cheap access to the above-mentioned information (Granovetter, 1983; Dekker, 2001; Henning and Zuckerman, 2006). My conceptual model suggests that social networking will influence this stage the most.

Technological transaction costs are divided into innovation transaction costs and physical transaction costs. Innovation transaction costs refer to resources which are sacrificed to gather reliable information on novelties and innovative production methods and processes (Henningsen et al, 2013). Apart from physical transportation, which is only determined by local distance and infrastructure, all sources of transaction costs—searching, negotiation, control, and innovation costs—are related to networks (Henningsen et al, 2013). The quality of the social network of the strategic sourcing manager can produce valuable information to the transaction. Hence, the quality and quantity of relationships with other professionals and the relevance of these partners may have an important impact on a firm's innovation transaction costs (Castilla et al, 2000).

Buying firms are paying more attention to working with suppliers that deliver by helping lower a customer's operational costs (Cannon & Homburg, 2001). It is the collaboration of the supplier and buyer, which is used to reduce costs. One of the main motivations of promoting cooperative supply relationships is the potential to drive down costs inherent in the exchange (Cannon & Homburg, 2001). The reduction in cycle time results in lower transaction costs. An appropriate alignment of transactions with the corresponding governance structure will allow an organization to economize on its costs (Schneider et al, 2013). The total costs are mitigated when the buyer and

the seller work together and adapt to each other over time. Total costs can be lowered when buyers and suppliers work together closely (Van Mieghem, 1995).

My research concept is consolidated into a single model: *Social Networking moderates the relationship between Supply Market Analysis and Cost Reduction, which inherently reduces costs through transaction cost theory.* Figure 4 shows the conceptual model.

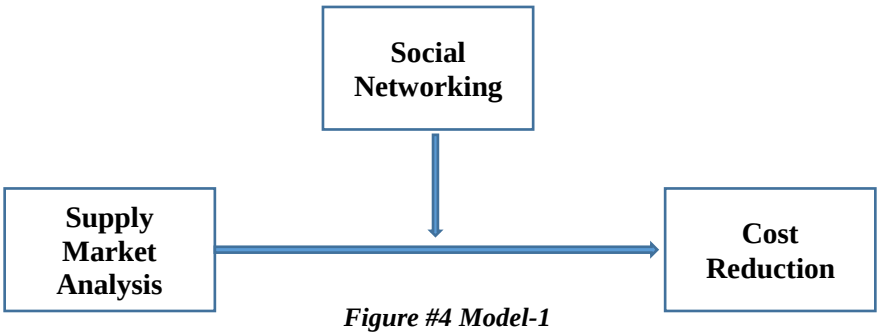


Figure #4 Model-1

Assumptions for Model-1

Assumption #1: Purchasing Managers are aware of Social Networking.

The management team of a new supplier, their profiles, public recommendations, and who they know is critical to the supply market analysis approach. Therefore, I make the following assumption:

Assumption #2: Social Networking is valued by Purchasing Managers.

Model-1 Hypotheses

Based on my research, I developed two hypotheses:

H-1 Supply Market Analysis will have a positive relationship on cost reduction.

Supply Market Analysis is the mechanism that develops the supplier network. Purchasing Managers align sourcing decisions with the core competencies of their organization to identify trustworthy suppliers, with a good reputation to support their firm's requirements and reduce the operational costs of a firm.

H-2 Social Networking moderates the relationship between Supply Market Analysis and cost reduction.

When Purchasing Managers select the right supplier for a firm through social networking, the cycle time to find viable suppliers reduce. This cost reduction is explained through Transaction Cost Theory. Therefore, social networking augments the relationship between supply market analysis and cost reduction. In Figure 5, the main effect of supply market analysis and cost reduction is moderated by social networking. When there is lower use of social networking, the strength between supply market analysis and cost reduction is lower. When there is higher use of social networking, the strength between supply market analysis and cost reduction is higher. Lower social networking is defined as one standard deviation below the mean. Higher social networking is defined as one standard deviation above the mean.

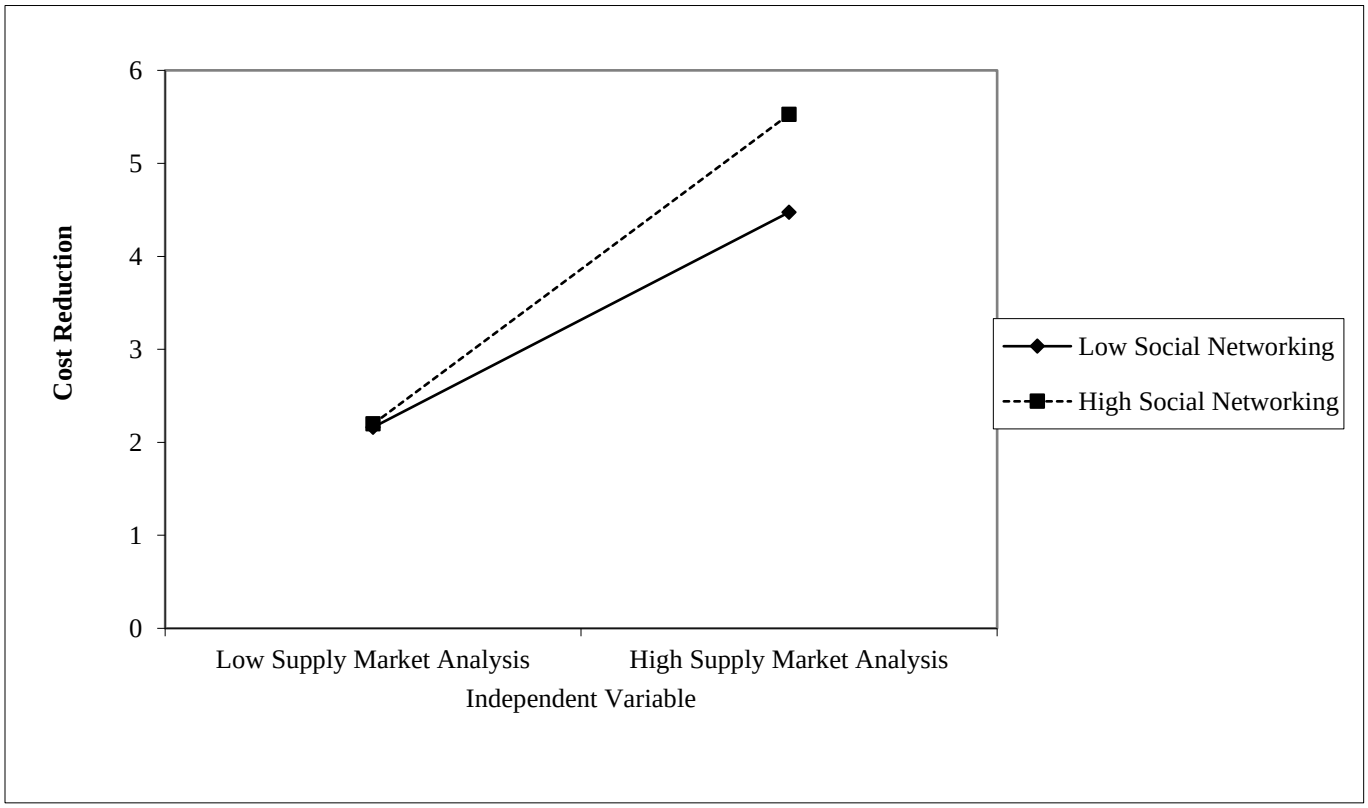


Figure #5

Methodology

In this thesis, a model was developed to study the relationship between supply market analysis, cost reduction and social networking. This thesis explores the moderating effect of social networking between supply market analysis and cost reduction. Data was tested using Ordinary Least Squares and Moderated Multiple Regression, and collected with an online survey. A copy of the survey is provided in the Appendix.

Statistical Power

This analysis was formulated to find support that shows supply market analysis, when strengthened by social networking, leads to cost reduction. The LinkedIn Sourcing and Procurement Group (public social media group within LinkedIn for Procurement Managers, Sourcing Managers, and Buyers), Procurious (public social media platform dedicated to Supply Chain/Procurement professionals), Institute for Supply Management-Chicago (Chicago chapter of the Institute for Supply Management, which is a not-for-profit educational association that helps professionals and organizations in the area of supply management through education, training, qualifications, publications, information, and research), and Cint (provides an online platform that connects panel owners to researchers based on the researcher's criteria) were the channels used for the survey; the total population size consisted of 51,485 subjects.

The size of the critical effect resided between the range of 0 and 1 to specify the population parameters. The effect size was r = .30. This was based on Cohen (1992, 1988), which suggests that .30 represents a medium effect and will account for 9% of the total variance. Essentially, it determines how strong the effect size is between the different variables in the model. The type of error associated with the inability to detect an effect is 1 – Beta; this was set at .95. The significance of power was determined using the statistical test of Correlation: Point biserial model in G-Power.

There was a 95% chance of detecting a moderation effect with a sample size of at least 111. To this, 22 (20%) additional data points were added to offset the impact of non-useable information bringing the target sample size to 133.

Ordinary Least Squares

A one-tailed t-test at a .05 (5%) p-value was used to confirm whether there is a directional relationship in the hypotheses. Ordinary Least Squares (OLS) regression was used to analyze the relationship between supply market analysis and cost reduction (H1). The purpose of OLS is to evaluate the relative impact of a predictor variable on a particular outcome (Zou et al, 2003). The objective was to confirm whether there is a positive relationship between supply market analysis and cost reduction.

Moderated Multiple Regression

A moderated multiple regression (MMR) analysis was used to determine whether the relationship between supply market analysis and cost reduction is moderated (influenced) by social networking (H2). To confirm whether a moderated effect exists, a moderated multiple regression (MMR) was performed on the survey results using SPSS. MMR is a frequently used statistical technique to test the effects of moderator variables (Aguinis, 1995). The primary intention was to show that the positive relationship between supply market analysis and cost reduction changes as the size, range, and strength of social networking changes. If there is a significant interaction between the moderator and the independent variable, it confirms that an effect of the independent variable on the dependent variable changes depending on the level of the moderator.

Survey Method

In accordance with the DePaul University's Institutional Review Board process, an online survey

through DePaul Qualtrics (see Appendix) was administered to Purchasing Managers (a.k.a. Sourcing Managers, Procurement Managers, or Buyers). The survey was sent to a population of 40,000 Purchasing Managers/Experts via the LinkedIn Sourcing and Procurement Group, 10,000 Purchasing Managers/Experts via Procurious, 1,353 Purchasing Managers/Experts via the Institute for Supply Management-Chicago members, and 132 Purchasing Managers/Experts via Cint. Members were given an invitation in the LinkedIn Sourcing and Procurement group forum, in the Procurious discussion forum, through the ISM-Chicago content director, and through the Cint survey administrator to complete the survey in Qualtrics.

Table 1 below describes the properties of measures and the related references. The measures were adopted from existing research to substantiate the structure of the survey.

Construct	Dimensions	Items*	References
Supply Market Analysis	Supply Market Profile	▪ The supply market is highly competitive. ▪ There are a large number of capable suppliers. ▪ The switching cost is very low.	Knight, Louise, Yi-Hsi, Tu, Preston, Jude (2014). Integrating skills profiling and purchasing management: An opportunity for building purchasing capability. *Int. J. Production Economics*. 271-283.
Social Networking	Network Range	▪ Peers same industry ▪ Peers other industry ▪ Suppliers ▪ Clients ▪ Industry organizations ▪ Competitors ▪ Other companies' partners	Fernández-Pérez, Virginia and Gutiérrez-Gutiérrez, Leopoldo (2013): "External managerial networks, strategic flexibility and organizational learning: A comparative study between Non-QM, ISO and TQM firms". Total Quality Management & Business Excellence. Vol.24, n.3/4, pp.243-258. 2012.

	Network Size	▪ None = (0) ▪ (1-3) ▪ (4-5) ▪ (6-10) ▪ (11-15) ▪ (16-25) ▪ (>25) = Many	
	Network Strength	▪ Peers same industry ▪ Peers other industry ▪ Suppliers ▪ Clients ▪ Industry organizations ▪ Competitors ▪ Other companies' partners	
Cost Reduction	Cost Performance	▪ It has been possible to achieve higher than average reductions in cost. ▪ It has been possible to achieve more cost-effective than average total cost. ▪ The reductions in cost achieved are considerably higher than expected. ▪ The total costs achieved are considerably better value than expected.	Hesping, Frank, (2017). Tactics for Cost Reduction and Innovation: Empirical evidence at the category level. *Supply Management Research.*, 17-33.

Table 1

***** Likert Scale**,** Supply Market Profile **(***1 = strongly disagree to 5 = strongly agree);* Network Range (*1 = Distant to 7 = Very Close*), Network Strength (*Very often=1 2 3 4 5 6 7=Very infrequently*); Cost Performance (*1 = "strongly disagree," 7 = "strongly agree")*
Nominal Scale, Network Size **(**None = (0) (1-3) (4-5) (6-10) (11-15) (16-25) (>25) = Many)

Results

There were a total 179 survey participants. Out of the 179 participants, only 104 of the subjects had responses that could be analyzed. Any missing survey responses from a subject were not analyzed. Pursuant to Kelley et al (2003), if a subject did not answer at least 75% of the

questions, they were discarded from the analysis entirely. This means that at least 21 of the 28 questions had to be completed to be considered. There were no cases where respondents answered at least 75% of the responses and left an entire section blank (e.g. did not complete the questions related to cost reduction). Subjects were also discarded if they indicated they had no purchasing experience. The data was screened for careless responses to mitigate the risk of spurious within-group variability and lower reliability (Clark, Gironda, & Young, 2003). Careful responding requires cognitive processing; abnormal survey times suggest the presence of insufficient effort responding (Huang et al, 2012). A response time of two seconds per item was used as the cutoff to identify insufficient effort responding (Huang et al, 2012). For this study, since there were 28 total items for this study, an overall response time of lower than 56 seconds from a participant indicated insufficient effort responding. Three respondents were removed from consideration based on this metric. The average total survey response time of all the considered responses was 9.17 minutes. The sample was diverse and reflected the diversity among Purchasing Managers (see Table 2). The relative set of questions for each variable (supply market analysis, social networking, and cost reduction) were used to find the mean. In the case of dissimilar categories, the 7-point Likert scale was used for consistency. For example, the varying degrees of network size was aligned to the 7-point Likert scale (i.e. 1 = 0, 2 = 1-3, etc.). Table 3a presents the means and standard deviations for the three variables studied. Table 3b presents the correlation matrix between these variables. The mean of each variable was calculated to perform an Ordinary Least Squares and Moderated Multiple Regression analysis to test for H1 and H2, respectively.

The demographic segments reflected a fairly equal response rate between males (51%) and females (49%). The vast majority of respondents had some college (16.3%), a Bachelor's degree

(40.4%), or a Master's degree (17.3%). More than half of participants were currently Purchasing Managers (64%); 71% of respondents had anywhere from 1 to 10 years of experience as a Purchasing Manager.

Cronbach's alpha was used to assess the reliability or internal consistency of the items in the survey instrument (Cronbach, 1951). Reliability was confirmed to be lower than the recommended minimal reliability of .70 (Nunnally, 1978) for the three items related to the supply market analysis construct (Cronbach's Alpha = .41). To find the source of the reliability issue, each one of the three items were tested for reliability in various combinations (e.g. items 1 and 2, items 2 and 3, items 1 and 3). The correlation between the remaining two items was high enough to warrant computation of the scale using two items. Therefore, the third item was removed to illustrate the significance of the improved reliability. Cronbach's coefficient for the three constructs of supply market analysis, social networking, and cost reduction is shown in Table 4.

Table 2. Demographic characteristics of the Sample

Category	n of Participants	% of Participants
Sex		
Male	53	51
Female	51	49
Age		
21 – 30	30	28.8
31 – 40	39	37.5
41 – 50	13	12.5
51+	22	21.2
Level of Education		
Some high school, no diploma	3	2.9
High School graduate or GED	10	9.6

Some college	17	16.3
Trade/vocational training	3	2.9
Associate degree	9	8.7
Bachelor's degree	42	40.4
Master's degree	18	17.3
Doctorate degree	2	1.9
Currently a Purchasing Manager		
Yes	67	64.4
No	37	35.6
Years of Experience		
1 – 10	74	71.1
11 – 20	24	23.1
21+	6	5.8

(N = 104)

Table 3a. Descriptive Statistics

	Mean	Std. Deviation	N
Supply Market Analysis	5.2212	1.09240	104
Social Networking	4.4268	.83030	104
Cost Reduction	4.5224	.98192	104

Table 3b. Correlations Matrix

	Supply Market Analysis	Social Networking	Cost Reduction
Supply Market Analysis	1	.343*	.284*
Social Networking	.343*	1	.421*

Cost Reduction	.284*	.421*	1

*Correlation at .05 (1-tailed test) is significant
N = 104

Table 4. Cronbach's Coefficient Alpha

Item	Supply Market Analysis	Social Networking	Cost Reduction
Coefficient alpha	.411	.863	.784
Total # of Items	**3**	**21**	**4**

Ordinary Least Squares

The effect of supply market analysis on cost reduction depicted a positive and significant relationship. F is significant at 8.963 (see table 5b). The data consisted of two variables: (1) supply market analysis and (2) cost reduction. Table 5 reflects the results from that analysis. Table 5 provides the model summary and coefficients. There is an R-squared of .081 (8.1%), which indicates that roughly 8% of the total variance of cost reduction can be explained by supply market analysis.

Table 5a. Ordinary Least Squares Regression

R-squared	**Adjusted R-squared**	**Standard Error**	**F**	**No. of observations**
.081	.072	.94603	8.963	104
Variables	**Coefficient**	**Standard Error**	**95% CI**	**p-value**
Intercept	3.189	.455	2.286-4.091	<0.05
Supply Market Analysis	.255	.085	.086-.425	<0.05

N = 104

Table 5b. Ordinary Least Squares Regression (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	8.022	1	8.022	8.963	.003[b]
	Residual	91.287	102	.895		
	Total	99.309	103			

Moderated Multiple Regression

The Moderated Multiple Regression analysis showed that social networking does moderate the relationship between supply market analysis and cost reduction. The interaction (moderating effect) is significant. The data analysis involved three variables: (1) supply market analysis, (2) social networking, and (3) interaction. To test moderation, the independent variables (supply market analysis and social networking) were mean-centralized by finding the mean of each variable and subtracting the respective mean from that variable. The independent variables were mean-centralized to alleviate concerns related to collinearity (Smith and Sasaki, 1979). Two models were calculated. First, a regression model (Model 1) was performed to predict the outcome of cost reduction from both independent variables. Secondly, the interaction variable was included to test the interaction effect (Model 2). The interaction variable was obtained by multiplying the mean-centered independent variables. Model 1 shows the effect of the two independent variables on cost reduction, absent interaction. Only social networking is independently significant. Model 2 displays the effect of the variables when interaction ensues. Table 6a provides the analysis of variance (ANOVA); 6b provides the model summary.

Table 6a. ANOVA					
	Sum of Squares	*df*	*Mean Square*	*F*	*p*
Model 1					

Regression	19.795	2	9.897	12.572	.000
Residual	79.514	101	.787		
Total	99.309	103			
Model 2					
Regression	25.000	3	8.333	11.215	.000
Residual	74.308	100	.743		
Total	99.309	103			

Table 6b. Moderated Multiple Regression				
	B	*Beta*	*t*	*p*
Model 1				
Constant	4.522		51.979	.000
Supply Market Analysis	.142	.158	1.671	.098
Social Networking	.434	.367	3.867	.000
F Change	12.572 p < .05			
Adjusted r2	.183			
Model 2				
Constant	4.455		50.490	.000
Supply Market Analysis	.140	.156	1.694	.093
Social Networking	.408	.345	3.732	.000
Interaction	.218	.230	2.647	.009
F Change	7.006, p < .05			
Adjusted r2	.229			

Change in Adjusted r2	.046

N = 104

Statistical Implications

Only 8% of the change in cost reduction can be explained by supply market analysis. However, the coefficient of supply market analysis is statistically significant. This suggests that a change in supply market analysis is related to a change in cost reduction. The interaction is confirmed because the independent variable (supply market analysis) on the dependent variable (cost reduction) is affected by the insertion of the social networking (moderator) variable (Aguinis & Gottfredson, 2010; Baron & Kenny, 1986). There must be a significant regression coefficient, a significant overall F, and a significant change in F at the .05 level to substantiate a moderation effect. In this case, there is a significant F, significant F change, and the regression coefficient is significant.

The interaction plot in Figure 6a provides an analogous depiction of H-2. There is statistical significance to validate interaction. The variability in cost reduction is affected by the combination of social networking and supply market analysis. When the practice of social networking is high, the standard deviation is one standard deviation above the mean, and the slope is significant at the .05 level. When the practice of social networking is low, the standard deviation is one standard deviation below the mean, and the slope is not significantly different from zero.

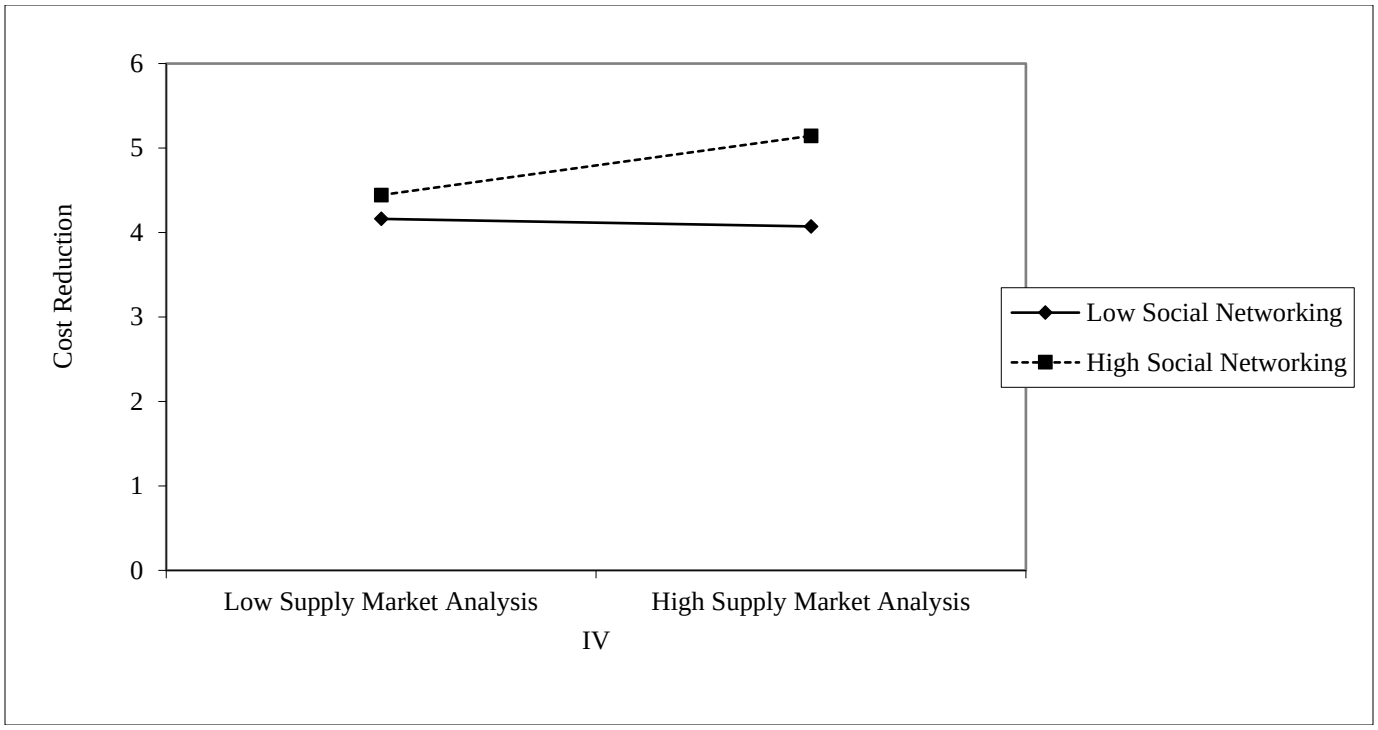


Figure #6a Interaction Plot for Social Networking

Discussion

The primary intent of this study was to investigate the role of social networking in the process of sourcing suppliers. This was accomplished by focusing survey respondents on the use of supply market analysis as an essential piece of the strategic sourcing approach to find competitive suppliers. While the results do not exactly support the assumptions made in Figure 4, the main effect of social networking on cost reduction is significant at the .05 level. Purchasing Managers can use social networking as an independent option to affect cost reduction. Findings indicate that social networking, in and of itself, is not a universal solution for identifying competitive suppliers. Rather, it is another option for finding suppliers that ultimately impact cost reduction.

Competitiveness of the supply market

A salient discovery for Purchasing Managers is the recognition of a high number of proficient suppliers. Respondents reported an average score of 5.41 when considering whether their supply market was highly competitive. Roughly 77% of respondents agreed that their supply market was highly competitive. This suggests that Purchasing Managers have the option to switch to alternative suppliers. However, while Purchasing Managers may consider the supply market competitive, it may not constitute a supplier switch, if the overall performance of a supplier is acceptable. There can be many reasons why a Purchasing Manager decides to remain with the existing supplier or engage a new supplier. According to Klemperer (1995), some of the major sources of switching costs identified in economic models include: the need for compatibility with existing equipment, transaction costs of switching suppliers, the cost of learning to use new brands, uncertainty about the quality of untested brands, discount coupons, and the psychological costs of switching. When respondents were asked to consider whether their switching costs were low, respondents reported an average score of 3.91. This indicates that respondents were mostly indifferent or undecided about their switching costs being low. This intensifies the importance of accessing relevant information about suppliers to encourage purchases that enhance cost performance. When a Purchasing Manager initiates the supply market analysis aspect of strategic sourcing, social networking can help in accessing relevant information about suppliers.

When participants contemplated their supply market, it is plausible that some participants considered new suppliers, while others considered existing suppliers. Switching from a new supplier to a new supplier, versus switching from an existing supplier to a new supplier, can have different outcomes on switching costs. For example, if a Purchasing Manager needed to buy laptops, but doesn't currently have a contract in place with a supplier or does not have a preferred supplier, Supplier A (new supplier) and Supplier B (new supplier) offer low switching

costs because of the competitive supply market. However, if Supplier A was a current or preferred supplier for the Purchasing Manager, and Supplier B was a new supplier, the switching costs are likely to be higher, due to the unfamiliarity and risk related with engaging a new supplier. Uncertainty on which specific scenario to consider can likely explain the indifference many of the respondents seemed to exhibit in their scoring.

Social networking as a sourcing strategy

The initial findings of social networking revealed that social networking, when looked at as a linear combination of network range, network size, and network strength moderates the relationship between supply market analysis and cost reduction. The mean score of social networking was 4.42, which indicates that Purchasing Managers indeed use social networking to find suppliers. However, since social networking is a multi-faceted construct, a post hoc analysis was conducted to examine the social networking construct more closely. The range, size, and strength of relationships dictate the effect social networking can have when utilized. Each element consists of nuances that help Purchasing Managers understand the dynamics of social networking when sourcing suppliers. Moreover, they are able to prioritize these aspects as applicable for maximum benefit. For example, it was discovered that network range and network strength have a significant moderating effect on the relationship between supply market analysis and cost reduction (see Figure 7c and 7m). This means that a focus on these sub-areas of social networking can affect the strength of the relationship between the variables.

Practical Implications

As practitioners, Purchasing Managers are relied upon to have keen insights on suppliers that can support their organization. There is an opportunity for Purchasing Managers to enhance the way they source by concentrating on certain dimensions of social networking. The quality of

relationships from a Purchasing Manager's social network can provide real value to the sourcing process. In this study, the lack of significance related to network size infers that the quality of relationships is more important than the size of a network. Purchasing Managers should therefore not focus on increasing the size of their network, but rather evaluate and leverage the range and strength of their relationships to foster value. During the sourcing process, Purchasing Managers can hone in on the range and strength of their social network to help them find competitive suppliers. Purchasing Managers can accomplish this by cultivating closer relationships (range) with their social contacts, and by increasing the communication frequency (strength) with their contacts. As Purchasing Managers manage their social relationships, they should contemplate how well they exercise range and strength with their different contacts. By doing so, they can effectively organize their social network to source suppliers who ultimately provide improved reduction in costs.

Post hoc analysis of the moderating effect

A post hoc analysis was conducted to closely examine the significant moderation effect of supply market analysis and social networking on cost reduction. Since social networking is explained through the linear combination of network range, network size, and network strength, each variable is contrasted to draw objective insights. These three social networking components are explored to understand the robustness of the overall significant moderation effect, and the possible effects of each item on cost reduction. Tables 7a-7o provide the descriptive statistics and regression results (ANOVA, model summary, and correlation matrix) for network range, network size, and network strength, respectively.

Descriptive statistics and regression results for network range, network size, and network strength

Network Range

Table 7a. Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Range	104	2.29	7.00	4.6003	1.02612
Valid N (listwise)	104				

Table 7b. ANOVA					
	Sum of Squares	*df*	*Mean Square*	*F*	*p*
Model 1					
Regression	13.869	2	6.934	8.197	.001
Residual	85.440	101	.846		
Total	99.309	103			
Model 2					
Regression	23.151	3	7.717	10.133	.000
Residual	76.158	100	.762		
Total	99.309	103			

Table 7c. Moderated Multiple Regression				
	B	*Beta*	*t*	*p*
Model 1				
Constant	4.522		50.144	.000
Supply Market Analysis	.171	.191	1.928	.057
Network Range	.249	.260	2.629	.010
F Change	8.197, $p < .05$			

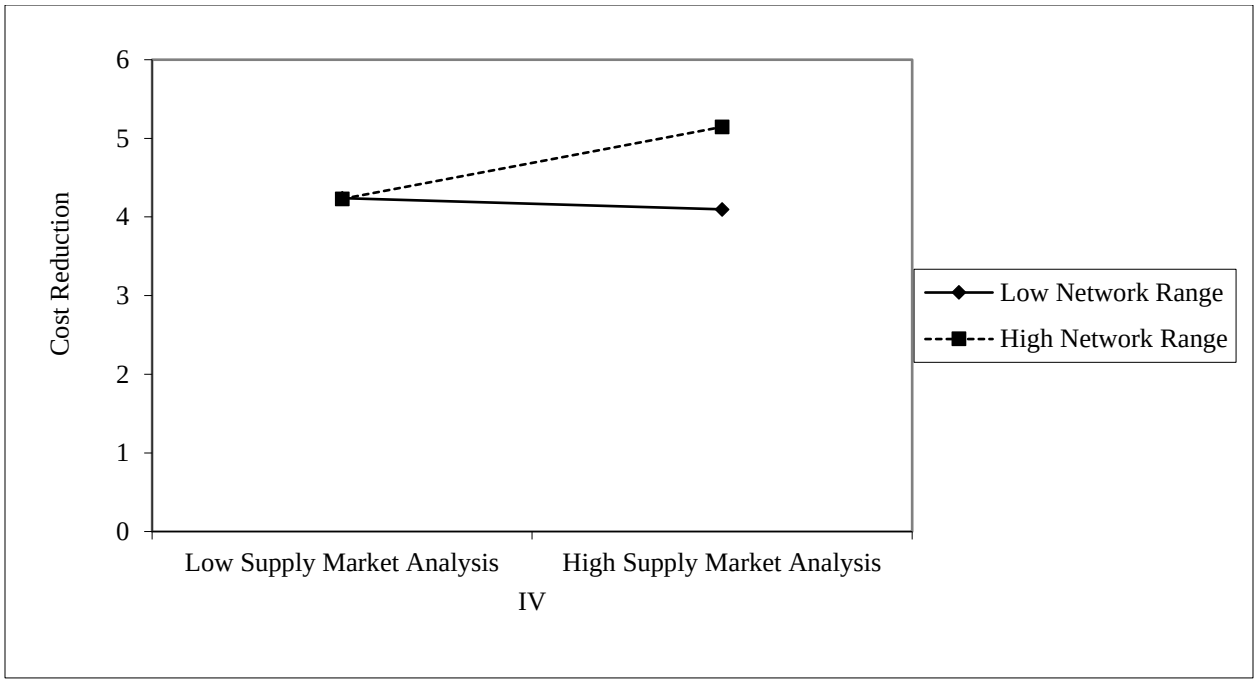
Adjusted r2	.123			
Model 2				
Constant	4.428		49.341	.000
Supply Market Analysis	.177	.196	2.092	.039
Network Range	.253	.265	2.820	.006
Interaction	.236	.306	3.491	.001
F Change	12.188, $p < .05$			
Adjusted r2	.210			
Change in Adjusted r2	.087			

Table 7d. Correlation Matrix

	Supply Market Analysis	Network Range	Cost Reduction
Supply Market Analysis	1	.360*	.284*
Network Range	.360*	1	.329*
Cost Reduction	.284*	.329*	1

*Correlation at .05 (1-tailed test) is significant
N = 104

Table 7e. Interaction Plot for Network Range



Network Size

Table 7f. Descriptive Statistics.					
	N	Minimum	Maximum	Mean	Std. Deviation
Size	104	1.71	7.00	4.2628	1.10390
Valid N (listwise)	104				

Table 7g. ANOVA					
	Sum of Squares	*df*	*Mean Square*	*F*	*p*
Model 1					
Regression	20.441	2	10.220	13.088	.000
Residual	78.868	101	.781		
Total	99.309	103			
Model 2					
Regression	22.155	3	7.385	9.572	.000
Residual	77.153	100	.772		

Total	99.309	103			

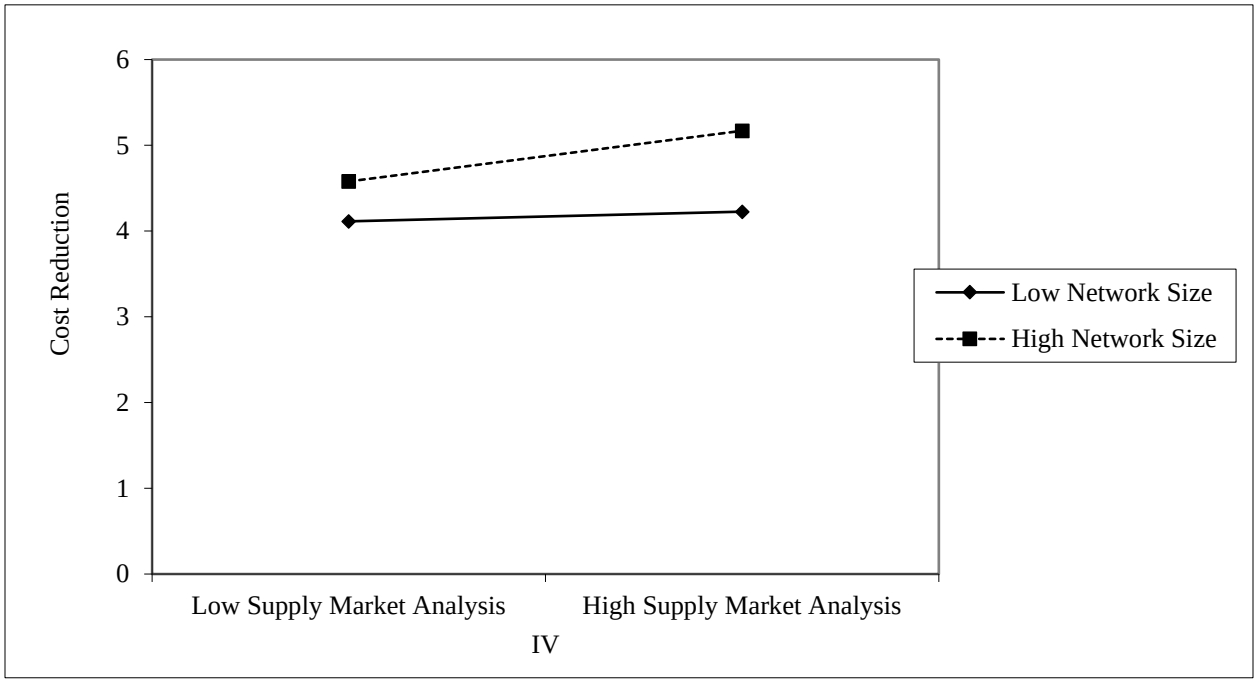
Table 7h. Moderated Multiple Regression				
	B	*Beta*	*t*	*p*
Model 1				
Constant	4.522		52.192	.000
Supply Market Analysis	.184	.205	2.258	.026
Network Size	.322	.362	3.988	.000
F Change	13.088 p < .05			
Adjusted r2	.190			
Model 2				
Constant	4.497		51.182	.000
Supply Market Analysis	.161	.179	1.950	.054
Network Size	.319	.358	3.965	.000
Interaction	.099	.134	1.491	.139
F Change	2.223 p > .05			
Adjusted r2	.200			
Change in Adjusted r2	.01			

Table 7i. Correlation Matrix			
	Supply Market Analysis	Network Size	Cost Reduction
Supply Market Analysis	1	.218*	.284*

Network Size	.218*	1	.407*
Cost Reduction	.284*	.407*	1

*Correlation at .05 (1-tailed test) is significant
N = 104

Table 7j. Interaction Plot for Network Size



Network Strength

Table 7k. Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Strength	104	2.29	7.00	4.4174	1.02380
Valid N (listwise)	104				

Table 7l. ANOVA					
	Sum of Squares	*df*	*Mean Square*	*F*	*p*
Model 1					

Regression	11.737	2	5.868	6.768	.002
Residual	87.572	101	.867		
Total	99.309	103			
Model 2					
Regression	15.310	3	5.103	6.076	.001
Residual	83.999	100	.840		
Total	99.309	103			

Table 7m. Moderated Multiple Regression				
	B	*Beta*	*t*	*p*
Model 1				
Constant	3.412		7.405	.000
Supply Market Analysis	.213	.237	2.458	.016
Network Strength	.191	.199	2.070	.041
F Change	6.768, $p < .05$			
Adjusted r2	.101			
Model 2				
Constant	3.318		7.280	.000
Supply Market Analysis	.223	.249	2.620	.010
Network Strength	.201	.210	2.211	.029
Interaction	.142	.191	2.063	.042
F Change	4.254, $p < .05$			
Adjusted r2	.129			

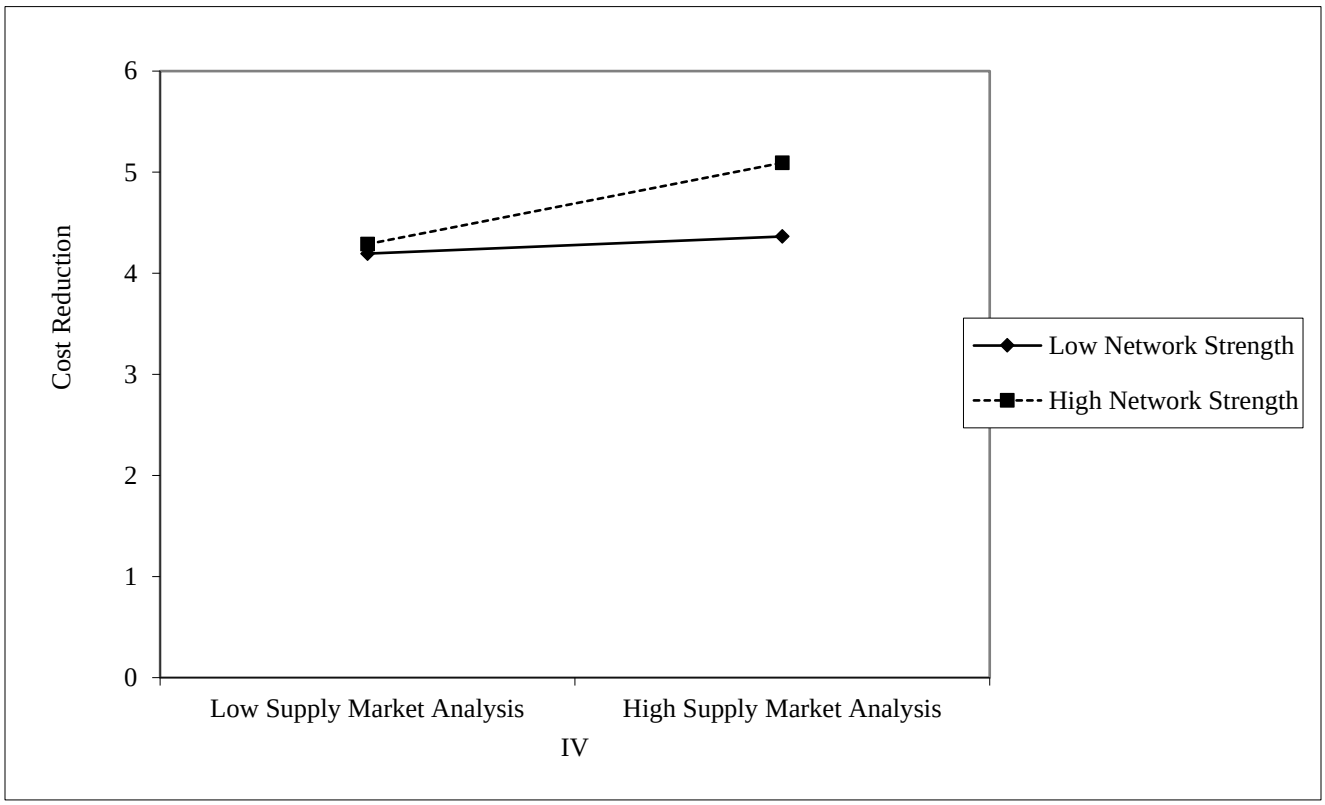
Change in Adjusted r2	.028

Table 7n. Correlation Matrix

	Supply Market Analysis	Network Strength	Cost Reduction
Supply Market Analysis	1	.239	.284*
Network Strength	.239	1	.256*
Cost Reduction	.284*	.256*	1

*Correlation at .05 (1-tailed test) is significant
N = 104

Table 7o. Interaction Plot for Network Strength



Respondents described the range of their network in each category as moderately close with a mean score of 4.60. This indicates that the social networks of Purchasing Managers do reflect heterogeneity, but at a modest level. This is a reasonable outcome when you consider that the diversity of a social network is not necessarily indicative of a strong social network. While social networking research does proclaim that the access of functional information might be better in a diverse social network, it does not eliminate the risk of complexity in the information obtained. This can lead to inflexible and delayed decisions (Simon, 1959; Szulanski, 1996). The modest approach to social networking as identified by Purchasing Managers suggests that there is a delicate balance between useable and complex information. In addition, the social network of a Purchasing Manager could likely not be as effective on either extreme (distant or very close) of a range of contacts.

The moderated multiple regression analysis for network range revealed that it is a moderating variable. Network range had a significant overall F (10.133), F change (12.188), and regression coefficient (.236). The negative slope for network range is not significantly different than zero (see figure 7e). The interaction plot illustrates the enhancing effect of network range that as supply market analysis and network range increases, cost reduction increases. When supply market analysis was lower, network range and cost reduction are lower. In other words, Purchasing Managers with higher use of supply market analysis and relationships with closer range, experienced higher cost reductions. This suggests that the interaction exhibited between Purchasing Managers and their diversity of contacts can improve cost performance. It was observed that respondents rated suppliers (mean = 5.40), clients (mean = 5.05), and peers same industry (mean = 4.85) as the contacts of whom they had the closest interaction. These numbers indicate that there is a priority associated with suppliers, clients, and peers in the same industry.

Purchasing Managers will likely have an increased impact on cost reduction, if they have a close relationship with these three groups. Presumably, this is due to the shared interests of these respective groups. Purchasing Managers and their suppliers are likely closer because of supply and demand. Suppliers satisfy the demand expressed by Purchasing Managers. Clients are indirectly affected by the sourcing decisions made by Purchasing Managers. It is plausible that Purchasing Managers would reach out to their clients to understand the impact of their sourcing decisions, thereby increasing their interaction with them. Peers in the same industry have similar experiences as Purchasing Managers. If a Purchasing Managers need to source suppliers, it stands to reason that their peers have insight on which suppliers are competitive. This does not diminish the importance of the other relationships. Rather, it provides a strategy for which contacts to focus their interaction in their range of contacts to help them find the best suppliers.

The average size of a Purchasing Manager's social network was identified at six to ten contacts for each category with a mean score of 4.26. This implies that Purchasing Managers have an opportunity for growth in the size of their social network. The immensity of a social network leads to an increase in access to more pertinent knowledge. When there is a greater number of contacts, there is an elevated number of points of view, which in turn leads to knowing more ideas and creating new ones (Burt, 1992; Obstfeld, 2005). Findings indicated that there are instances when the small size of a Purchasing Manager's network still led to a cost reduction. Of the 104 respondents, 23% of them indicated they had a range of contacts of one to five. Of the 24 respondents, 21% (5) of them confirmed they still experienced a cost reduction. While this is a small sample, this does introduce a quantity versus quality argument, whereas less can be more. For example, a CEO is likely to exhibit more social capital than a mid-level manager. So, if the mid-level manager has more contacts, it is not necessarily a foregone

conclusion that the manager's contacts reflect access to more valuable information. Notwithstanding this, the size of a Purchasing Manager's social network does have merit, and is a factor when a Purchasing Manager requires information on the capabilities of a supplier.

The moderated multiple regression analysis for network size revealed that it is not a moderating variable for supply market analysis and cost reduction. While the overall F is significant (9.572), the F change (2.223) and regression coefficient (.099) are not significant. The interaction plot shows the effect of network size on supply market analysis and network. As network size increases, cost reduction increases. This indicates that size does have an effect on the relationship between the two variables, in terms of standard deviation. The variability in cost reduction is affected by the blend of network size and supply market analysis. It should be noted, however, that the two lines are fairly close to being parallel, which signifies little effect.

The strength of the network ties between a Purchasing Manager and each category revealed a moderate level of communication frequency with a mean score of 4.41. This seems to be similar to how the Purchasing Managers responded to the questions regarding range (mean = 4.60) and size (mean = 4.26). This implies that there could be a correlation between the frequency of communication that is generated by Purchasing Managers, and the strength and density of their social network. In other words, the frequency of interaction between a Purchasing Manager and their social network can be linked to the strength of network ties, and the solidity of those ties. This could likely be signaling that while Purchasing Managers engage with their social network, they are not completely dependent on it. This is beneficial to the acquisition of innovative perspective from the social network. Granovetter's (1973) strength-of-weak-ties theory says that networks saturated with weak ties are particularly valuable to the production of creative ideas because they allow for enhanced access and exposure to socially distant pockets of information.

The moderate level of interaction strength conveyed by Purchasing Managers dispenses an opportunity for creative information that would likely not be available with strong ties (communication).

The moderated multiple regression analysis for network strength confirmed that it moderates the relationship between supply market analysis and cost reduction. Network range had a significant overall F (6.076), F change (4.254), and regression coefficient (.142). The interaction plot shows the amplifying effect of network strength. When supply market analysis was lower, network strength and cost reduction was lower. Purchasing Managers with higher use of supply market analysis and stronger ties experienced a higher cost reduction. Purchasing Managers rated peers same industry (mean = 4.69), clients (mean = 4.57), and industry organizations (4.45) the highest. This closely resembles how Purchasing Managers responded to network range; the exception being industry organizations, in lieu of suppliers. Purchasing Managers seem to have stronger communication and interaction with their clients and peers in their industry. It seems reasonable that Purchasing Managers would not have as much communication with their suppliers. Purchasing Managers desire to maintain fairness in the sourcing process by being selective with the information they share with their suppliers. It is important to examine the economic value of confidentiality to the parties involved in an information exchange (Li and Zhang, 2008). This means that if information is leaked irresponsibly to a supplier, it can lead to financial consequences. For example, a Purchasing Manager could disclose information to a supplier and unintentionally release negotiation leverage; if that leverage was maintained by the Purchasing Managers it could have resulted in a better deal. However, it is important for Purchasing managers to evaluate whether they have a trusted or non-trustworthy relationship with their supplier(s). Purchasing Managers can then determine which suppliers should benefit

from the information sharing to facilitate better cost performance for them.

Cost reduction achieved from purchasing decisions

Respondents reported an average score of 4.52 when asked whether cost reduction was achieved. This suggests that Purchasing Managers moderately agreed that they experienced a cost reduction from their purchasing decisions. The study provided evidence of the effect a Purchasing Manager can have on the operational costs of firm. Presumably, the cost performance is a function of the cost reduction initiated by the sourcing strategies implemented by the Purchasing Manager. Purchasing Managers identified their impact from purchasing decisions from a retrospective reflection of past purchasing decisions. Roughly 44% of Purchasing Managers conveyed that they experienced cost reductions considerably higher than expected based on their actions. This suggests that purchasing decisions can have an impact on cost reduction. A great strategic sourcing methodology is where companies start looking for significant savings from their supply chain (Singhal, 2015). When supply market analysis is exercised, social networking can assist Purchasing Managers with this endeavor.

Limitations

There were several limitations with this study. First, although the reliability of two of the constructs (social networking and cost reduction) had acceptable values of at least 0.7 (Nunnaly, 1978), supply market analysis had a reliability of .41. To address this issue, one of the items in supply market analysis was removed and a two-item scale was used. While this greatly improved the reliability value to .649, this is still lower than the standard. Additionally, since alpha cannot be calculated for two items, the removal of the third item jeopardizes the integrity of the alpha calculation. A pilot survey could have mitigated this issue from occurring. Select Purchasing Managers could have provided feedback on their understanding and perception of the survey

items to produce a more effective survey.

Secondly, to ensure a more effective response rate to the survey, this study had a correlational design. The causal design, or the "how" would involve several more variables to provide the full context of the innerworkings of what makes social networking a viable sourcing approach. Including these variables would have meant extending a 10-minute survey to a 30-minute survey, which would have likely been detrimental to the statistical power. It was important to condense this research to establish the foundation for future research on this topic.

Thirdly, the target sample size of 133 was not achieved. Some of the Purchasing Managers targeted for this survey were unwilling or unable to participate in the study. Although 104 usable responses were obtained, the failure to reach the target sample size introduces nonresponse bias to the survey. This is supported by the statistical significance discovered relative to the social networking variable when an independent sample t-test was performed (see Appendix). To perform the independent sample t-test, 28% of the early responses and late responses (proxy for non-response) were split into two groups and tested on the three variables (supply market analysis, social networking, and cost reduction). The reason for the non-responses can be attributed to the fact that the survey was administered online. Literature states that although online surveys have become popular in recent years, the inundation of email messages in general and online surveys have decreased response rates (Sheehan, 2001; Kaplowitz, Hadlock, & Levine, 2004).

Contribution and Future Research

There are several contributions of this study to the field of purchasing. The first contribution is from the empirical data captured from past and present purchasing professionals. This study sought to give practical perspective on the use of social networking as a means of identifying

competitive suppliers. It goes beyond the application of theory by confirming there is indeed an improved effect on cost from supply market analysis when social networking supports this relationship. This study reveals opportunities to expand sourcing strategies without limiting the sourcing approach. Social networking can be integrated as part of a hybrid sourcing approach of traditional sourcing schemes to improve cost.

As previously mentioned, this study sets the foundation for future research on this topic. This topic will be further developed to explain the "engine," or how social networking moderates the strategic sourcing process. There will be a deep dive into the primary elements of social currency and social capital, and their contribution to the social networking process. Further, when the demographic aspects of social networking were considered, younger participants (21 – 30) rated social networking higher (mean = 4.67) than older participants (51+) with a mean score of 4.09. This can likely be attributed to the notion that younger participants (Millennials) are more inclined to use social networking as compared to their older counterparts (Baby Boomers). However, the limited sample size did not provide enough statistical power to draw solid conclusions. Future research could involve taking a closer look at the identifiable differences with a larger sample size to provide unique insights with statistical significance.

With the advent of Blockchain, Purchasing Managers are in a great position to use social networking data to optimize and streamline the decision-making process. Blockchain is a database that provides an evolving list of records that are connected and secured through the practice of cryptography. Blockchain can help organizations reduce their transactions costs by allowing Purchasing Managers to acquire information about potential suppliers from a distributable database. Blockchain technology stores every detail of every transaction at every level of the supply chain. Future research to explore how this extends beyond the practical use of

online social networking to an advanced technological capability presented by blockchain is inevitable. There is an opportunity to test the mediating effect of blockchain technology to facilitate a cost reduction.

Conclusion

This study has provided insights into the effect of supply market analysis and to the value of social networking when it comes to cost reduction. The contribution of this study lies in showing the moderating role social networking plays in the relationship between supply market analysis and cost reduction. When compared to traditional strategic sourcing tactics, understanding the role of social networks could be a viable way to link innovation with the sourcing process. The linkage thus relates to improved cost performance as confirmed by the data collected from Purchasing Managers. Although the survey results were reasonably expected, they provide fascinating learnings that can advance the best practices used by Purchasing Managers when they are searching for competitive suppliers.

Appendix (Survey Sample)

Information for Participation in Research Study

Supply Market Analysis: The Moderating Effect of Social Networking on Cost Reduction

Principal Investigator: Adam Cockrell, DBA Student

Institution: DePaul University, USA

Faculty Advisor: Dr. Nezih Altay, PhD, Management Department

As organizations look for more efficient ways to grow and optimize their supplier network to meet demands, the supply market analysis process must be streamlined through online (e.g. LinkedIn, Facebook) and offline networks (industry conferences, mixers, memberships). I am conducting a research study to investigate how social networking (online and offline) influences the relationship between supply market analysis and cost reduction.

You are being asked to participate in this study because you are either an existing or former Purchasing Manager, Sourcing Manager, Procurement Manager, or Buyer. If you agree to participate in this study, I would ask that you complete a survey. The type of questions that will be asked are related to demographics (e.g. gender, age, occupation, industry, etc.) your experiences with supply market analysis (related to the 7 step strategic sourcing approach), social networking, and cost reduction. If there is a question you do not want to answer, you may skip it. The survey will take approximately 10 minutes to complete.

Your participation is voluntary, which means you can choose not to participate. There will be no negative consequences if you decide not to participate or change your mind later after you begin the study. You can withdraw your participation at any time prior to submitting your survey. If you change your mind later while answering the survey, you may simply exit the survey. Once you submit your responses, I will be unable to remove your data later from the study because all data is anonymous and I will not know which data belongs to you.

You must be age 21 or older to be in this study. This study is not approved for the enrollment of people under the age of 21.

If you have questions, concerns, or complaints about this study or you want to get additional information or provide input about this research, please contact Adam Cockrell, acockrel@mail.depaul.edu.

If you have questions about your rights as a research subject, you may contact Susan Loess-Perez, DePaul University's Director of Research Compliance, in the Office of Research Services at 312-362-7593 or by email at sloesspe@depaul.edu. You may also contact DePaul's Office of Research Services if:

- Your questions, concerns, or complaints are not being answered by the research team.
- You cannot reach the research team.
- You want to talk to someone besides the research team.

You may print this information for your records.

By completing the survey, you are indicating your agreement to be in the research.

1. What is your gender?

a. Male
b. Female

2. What is your age?

a. 21 - 30
b. 31 - 40
c. 41 - 50
d. 51+

3. What is the highest degree or level of school you have completed?

a. Some high school, no diploma
b. High school graduate or GED
c. Some college
d. Trade/vocational training
e. Associate degree
f. Bachelor's degree
g. Master's degree
h. Doctorate degree

4. Are you currently a Purchasing Manager?

a. Yes
b. No

5. In which industry are you (were you) primarily working?

6. How many years of experience as a Purchasing Manager do you have?

_____ Number of years

7. How much do you agree with the following statements? **(**1 = strongly disagree to 5 = strongly agree)

a. The supply market is highly competitive.
b. There are a large number of capable suppliers.
c. The switching cost is very low.

8. On average, how would describe your relationship with each category? **(**1 = Distant to 7 = Very Close)

a. Peers same industry
b. Peers other industry
c. Suppliers
d. Clients
e. Industry organizations (e.g. ISM, CIPS)
f. Competitors
g. Other companies' partners

9. On average, how many people are important sources of information regarding important industry trends and issues? (1 = (0) None, 2 = (1-3), 3 = (4-5), 4 = (6-10), 5 = (11-15), 6 = (16-25), 7 = (>25) Many

a. Peers same industry
b. Peers other industry
c. Suppliers
d. Clients
e. Industry organizations (e.g. ISM, CIPS)
f. Competitors
g. Other companies' partners

10. On average, how often do you communicate with each category? (Very often=1 to 7=Very infrequently)

a. Peers same industry
b. Peers other industry
c. Suppliers
d. Clients
e. Industry organizations (e.g. ISM)
f. Competitors
g. Other companies' partners

11. Consider the purchasing decisions you made in the last 3 years. Rate the degree to which you agree with the following statements. (1 = "strongly disagree," 7 = "strongly agree")

a. It has been possible to achieve higher than average reductions in cost.
b. It has been possible to achieve more cost-effective than average total cost.
c. The reductions in cost achieved are considerably higher than expected.
d. The total costs achieved are considerably better value than expected.

COMMENTS

12. Do you have any additional comments you would like to share?

Appendix (Statistics)

Independent Sample T-Test for Non-Response Bias

Group Statistics					
	Group	N	Mean	Std. Deviation	Std. Error Mean
Supply Market Analysis	Early responses	29	4.9655	.96504	.17920
	Late responses or non-responses	29	4.4828	.99437	.18465
Social Networking	Early responses	29	4.7054	.90249	.16759
	Late responses or non-responses	29	3.9508	.56595	.10509
Cost Reduction	Early responses	29	4.7845	.90811	.16863
	Late responses or non-responses	29	4.1667	1.01794	.18903

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Supply Market Analysis	Equal variances assumed	.040	.842	1.876	56	.066	.48276	.25731	-.03270	.99822
	Equal variances not assumed			1.876	55.950	.066	.48276	.25731	-.03271	.99823
Social Networking	Equal variances assumed	4.376	.041	3.815	56	.000	.75463	.19781	.35836	1.15090
	Equal variances not assumed			3.815	47.073	.000	.75463	.19781	.35669	1.15257

Cost Reduction	Equal variances assumed	.382	.539	2.439	56	.018	.61782	.25331	.11037	1.12527
	Equal variances not assumed			2.439	55.286	.018	.61782	.25331	.11022	1.12541

References

Aguinis, Herman, (1995). Statistical Power Problems with Moderated Multiple Regression in Management Research. Journal of Management, Vol. 21, No.6, 1141-1158

Aguinis, Herman & Gottfredson, Ryan K, (2010). Best Practice recommendations for estimating interaction effects Using moderated regression. *Journal of Organizational Behavior*, Vol. 31, 776-786.

Akerlof GA (1970) The market for 'lemons': Quality uncertainty and the market mechanism. The Quarterly Journal of Economics 84(3):488–500.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182.

Boyd, d. m. & Ellison, N. B. 2008. Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication.* 13, 210-230.

Burt, R.S. (1992). Structural holes; the social structure of competition. Cambridge, MA. Harvard University Press.

Buskens, V (1999). Social networks and trust. Dissertation, Utrecht University.

Carr, A.S., Smeltzer, L.R., (1997). An empirically based operational definition of strategic purchasing. *European Journal of Purchasing and Supply Management* 3 (4), 199–207.

Carter, J.R., & Narasimhan, R. (1996). Is Purchasing Really Strategic? International *Journal of Purchasing and Materials Management,* 32, 20-28.

Castilla EJ, Hwang H, Granovetter E, Granovetter M (2000) Social networks in Silicon Valley. In: Lee CM, Miller WF, Hancock MG, Rowen HS (eds) *The Silicon Valley Edge: A*

Habitat for Innovation and Entrepreneurship, Stanford University Press, Stanford, pp 218–247.

Chau, M. and Xu, J. (2007). Mining communities and their relationships in blogs: a study of online hate groups," *International Journal of Human-Computer Studies*, 65(1), 57-70, 2007.

Chen, Pei-yu and Hitt, Lorin M. (2005). Information Technology and Switching Costs. *Handbook on Economics and Information Systems.*

Cheung, C., & Chan, R. (2010). Social Capital as Exchange: Its Contribution to Morale. *Social Indicators Research*, *96*(2).

Clark, M. E., Gironda, R. J., & Young, R. W. (2003). Detection of back random responding: Effectiveness of MMPI-2 and personality assessment inventory validity indices.

Clegg, H. and Montgomery, S. (2005), "7 Steps for sourcing information products", Information Outlook, Vol. 9 No. 12, pp. 34-39

Coase, Ronald H. (1937), "The Nature of the Firm," Economica 4 (November): 386–405.

Cohen, J. "A Power Primer," Psychological Bulletin (112:1), 1992, pp. 155-159.

Cohen, J. Statistical Power Analysis for the Behavioral Sciences (2nd ed.), Lawrence Erlbaum, Hillsdale, NJ, 1988.

Coleman, J. S. (1988). Free riders and zealots: The role of social networks. Sociological Theory, 6(1), 52–57

Dekker DJ (2001) Effects of positions in knowledge networks on trust. Tech. Rep. TI 2001-062/1, Tinbergen Institute.

den Butter FAG, Mosch RHJ (2003) Trade, trust and transaction cost. Working Paper TI 2003-082/3, Tinbergen Institute, Amsterdam.

Dubois, A., Pedersen, A.C., 2002. Why relationships do not fit into purchasing portfolio models — a comparison between the portfolio and industrial network approaches. European Journal of Purchasing & Supply Management 8, 35–42

Ellram, L.M., Zsidsin, G.A., Siferd, S.P., & Stanley, M.J. (2002). The impact of purchasing and supply chain management activities on corporate success. *Journal of Supply Chain Management*, 38, 4-17.

Fernández-Pérez, Virginia and Gutiérrez-Gutiérrez, Leopoldo (2013): "External managerial networks, strategic flexibility and organizational learning: A comparative study between Non-QM, ISO and TQM firms". Total Quality Management & Business Excellence. Vol.24, n.3/4, pp.243-258. 2012.

Gargeya, V.B. and Su, J. (2004), "*Strategic sourcing and supplier selection: a review of survey-based empirical research*", paper presented at the 15th annual POM conference, Cancun.

Granovetter, M. (1973). The strength of weak ties. American Journal of Sociology, 78, 1360 – 1380.

Granovetter M. (1983) The strength of weak ties: A network theory revisited. Sociological Theory 1:201–233.

Granovetter, M. (1985), "Economic action and social structure: The problem of embeddedness", *American Journal of Sociology*, 3, 481-510.

Grant, R. (1996). Prospering in dynamically-competitive environments: Organizational capability as knowledge integration', *Organization Science*, 7, pp.375-387.

Green J, Sheshinski E, (1975). Competitive inefficiencies in the presence of constrained transactions. *Journal of Financial Economics*, 1:105–129.

Hargraves, David A (2008). Supply Market Analysis for a Competitive Advantage. 93rd Annual International Supply Management Conference.

Hargraves, David A (2010). Advanced Research Techniques for Supply Market Analysis: Finding the Best Results Fast. 95th Annual International Supply Management Conference.

Heide, J.B., & Stump, R.L. (1995). Performance implications of buyer-supplier relationships in industrial markets: a transaction cost explanation. *Journal of Business Research*, 32(1), 57-66.

Henning CHCA, Henningsen G, Henningsen A (2012) Networks and transaction costs. *American Journal of Agricultural Economics* 94(2):377–385.

Henning CHCA, Zuckerman EW (2006) Boon and bane of social networking in markets with imperfect information: Theory and evidence from Polish and Slovakian rural credit markets.

Henningsen, G., Henningsen, A., & Henning, C. H. C. A. (2013). Measuring the Influence of Networks on Transaction Costs Using a Nonparametric Regression Technique. *Institute of Food and Resource Economics*, University of Copenhagen. (IFRO Working Paper; No. 2013/11).

Hesping, Frank (2017). Tactics for Cost Reduction and Innovation: Empirical Evidence at the Category Level. *Supply Management Research*, 17-33.

I.C. Jain, (2014). Management Accounting. *University of Delhi.* Vikas Publishing House PVT LTD.

Huang, J., Curran, P., Keeney, J., Poposki, E., & DeShon, R. (2012). Detecting and deterring insufficient effort responding to surveys. Journal of Business and Psychology, 27(1), 99–114.

Inkpen, A.C. and Tsang, E.W.K. 2005. "Social Capital, Networks, and Knowledge Transfer", *Academy of Management Review*. 30, 1 146-165.

Joseph P. Cannon, Christian Homburg (*2001*) Buyer-Supplier Relationships and Customer Firm Costs. *Journal of Marketing*: January 2001, Vol. 65, No. 1, pp. 29-43.

Kalubanga, Matthew, (2012). Sustainable Procurement: Concept, and Practical Implications for the Procurement Process. *International Journal of Economics and Management Sciences.* Vol. 1, No. 7, pp. 01-07.

Kaplowitz, M. D., Hadlock, T. D., & Levine, &. a. (2004). A comparison of web and mail survey response rates. Public Opinion Quarterly, 94-101.

Kermarrec, A. M. & Le Merrer, E. (2012). Offline Social Networks: Stepping Away from the Internet. *In Proceedings of the Fifth Workshop on Social Network Systems.* (SNS '12), 14 (2), New York: ACM.

Kihanya, Titus Wachira, Wafula, Moses Kimani, Onditi, Evans Jiambo, Munene, Ambrose Muriithi (2015). The role of Strategic Sourcing on Organization's Peformance: A Case Study of Jomo Kenyatta University of Agriculture and Technology. International Journal of Scientific and Research Publications., Vol. 5, Issue 5.

Kraljic, P., 1983. Purchasing must become supply chain management. Harvard Business Review 61, 109–117.

Krause, D.R.; Pagell, M.; Curkovic, S. (2001): Toward a measure of competitive priorities for purchasing, in: *Journal of Operations Management*, 19 (4), pp. 497–512.Kumar, R., Raghavan, P., Rajagopalan, S., & Tomkins, A. (1999). Trawling the web for emerging cyber-communities. *Computer Networks*, 31(11-16), 1481-1493.

Li, L., H. Zhang. 2008. Confidentiality and information sharing in supply chain coordination. Management Science 54(8) 1467-1481.

Liebeskind, Julia P., Oliver, Amalya L., Zuker, Lynne G., Brewer, Marilynn B. (1994). Social Networks, Learning, and Flexibility: Sourcing Scientific Knowledge in New Biotechnology Firms. *University of California Los Angeles.* Vol.6, No.4.

Lin, N. and Erickson, B.H. (2008) Theory, measurement, and the research enterprise on social capital. In Lin, N. and Erickson, B.H., Eds., Social capital. An international research program. Oxford University Press Inc., New York.

McCue, Clifford P. and Johnson, Barbara R. (2010). Strategic Procurement Planning in the Public Sector. Herndon, VA: National Institute of Governmental Purchasing.

Narasimhan, Ram, and Das, Ajay (1999). An Empirical Investigation of the Contribution of Strategic Sourcing to Manufacturing Capabilities and Performance. *Decision Sciences*. Vol. 30, No.3

Nunnally, J. C. (1978), Psychometric Theory, 2nd ed., New York: McGraw-Hill.

Nunnally, J. C., & Bernstein, I. H. (1994). Psychometric theory (3rd ed.). New York: McGrawHill, Inc.

Obstfeld, D. (2005). Social networks, the tertius lungens orientation, and involvement in innovation. Administrative Science Quarterly, 50, 100-130.

Porter, M.E., (1979). How Competitive Forces Shape Strategy. *Harvard Business Review.*

Porter, M.E., (1985). Competitive Advantage, *The Free Press*, New York.

Portes A, Sensenbrenner J (1993) Embeddedness and immigration: Notes on the social determinants of economic action. American Journal of Sociology 98(6):1320–1350.

Powell, W. W. (1990.) Neither market nor hierarchy: Network forms of organization. *Research on Organizational Behavior,* 12: 295–336.

Preece, J. & Maloney-Krichmar, D. (2003). Online Communities. Focusing on Sociability and Usability. In Jacko & A. Sears (Eds.)., *Handbook of Human-Computer Interaction*, pp.596-620. Mawhah, NJ: Lawrence Erlbaum Associates.

Quinn, J.B. and Hilmer, F.G. (1994), Strategic outsourcing, *Sloan Management Review*, 35, 4, pp . 43-55.

Rendon, R.G., 2005. Commodity sourcing strategies: processes, best practices, and defense initiatives. *Journal of Contract Management* 3 (1), 7–20.

Richman, BD (2006) How community institutions create economic advantage: Jewish diamond merchants in New York. Law & Social Inquiry 31(2):383-420.

Rust, Roland T., Moorman, Christine, Dickson, Peter R. (2002). Getting Return on Quality: Revenue Expansion, Cost Reduction, or Both? *Journal of Marketing.* Vol.66, 7-24.

Schneider, Christian O., Bremen, Philipp, Schonsleben, Paul, Alard, Paul (2013). Transaction Cost economics in global sourcing. Assessing regional differences and implications for performance. *International Journal of Production Economics*., 141(1).

Scott, John. (1991). Social network analysis: A handbook. London: Sage.

Sheehan, K. (2001). E-mail survey response rates: A review. Journal of Computer Mediated Communication, January.

Schumpeter, J. A. (1934). Theory of Economic Develop- ment, Cambridge, MA: Har- vard University Press.

Simon, H.A. (1959). Theories of decision-making in economics and behavioural science, American Economic Review, 69 (3), 253-283.

Singhal, Jyoti. (2015). Cost Reduction through Strategic Sourcing: A Case Study of Walmart. *NBR E-Journal*, Vol. 1, Issue 1.

Smock, Douglas A., Rudzki, Robert A., and Rogers, Stephen C. (2007). Sourcing Strategy: The Brains Behind the Game, *Supply Chain Management Review.*

Su, J., Dyer, C. L., and Gargeya, V. B. (2009). Strategic sourcing and supplier selection in the U.S. textile-apparel-retail supply network. *Clothing and Textiles Research Journal*, *27*(2): 83-97.

Szulanski, G. (1996). Exploring International Stickiness. Impediments to the Transfer of Best Practice within the Firm. Strategic Management Journal, 17, 27-43.

Talluri, S., & Narasimhan, R. (2004). A methodology for strategic sourcing. *European Journal of Operational Research*, *154*(1), 236-250.

Terpend, R.; Krause, D.R.; Dooley, K.J. (2011): Managing buyer–supplier relationships: empirical patterns of strategy formulation in industrial purchasing, in: *Journal of Supply Chain Management*, 47 (1), pp. 73–94.

Thawiwinyu Kanyarat, Laptaned, Ungul, (2009). The Impact of Strategic Sourcing and E-Procurement on Supply Chain Performance Management. The 20th National Conference of Australian Society for Operations Research & the 5th International Intelligent Logistics System Conference

Uzzi, B (1996). The sources and consequences of embeddedness for the economic performance of organizations - the network effect. American Sociological Review 94.

Van Mieghem, Jan A., (1995). Dyanmic Scheduling with Convex Delay costs: The Generalized c|mu Rule. *The Annals of Applied Probability*. Vol.5, No.3, pp. 809-833.

Walther, J. B. (1994). Anticipated ongoing interaction versus channel effects on relational communication in computer-mediate interaction. *Human Communication Research*, 20 (4), 473 – 501.

Wasserman, Stanley, & Faust, Katherine. (1994). Social network analysis. Cambridge, MA: Cambridge University Press.

Wellman, Barry, Carrington. Peter J., & Hall, Alan. (1988). Networks as personal communities. In B. Welhnan & S.D. Berkowitz (Eds.), Social structures: A network approach (pp. 130-I 84). Cambridge: Cambridge University Press.

Williamson, Oliver E. (1975). Markets and Hierarchies. New York: Free Press.

Williamson, Oliver E. 1985. The Economic Institutions of Capitalism. New York: Free Press.

Yong, Roy, Chua, Joo, Ingram, Paul, Morris, Paul W. (2008). From the Head and the Heart: Locating Cognition-and Affect-Based Trust in Managers' Professional Networks. *Academy of Management Journal.* Vol. 51, No. 3, 436-452.

Zou, Kelly H, Tuncali, Kemal, Sliverman, Stuart G, (2003). Correlation and Simple Linear Regression.

Zucker, Lynne G. (1991) 'Postscript: microfoundations of institutional thought', in Walter W. Powell and Paul J. DiMaggio (eds), *The New Institutionalism in Organizational Analysis. Chicago, IL: University of Chicago Press*, pp. 103-7.